

High Performance Computing-Accelerated Metrology for Large Optical Telescopes, Phase II

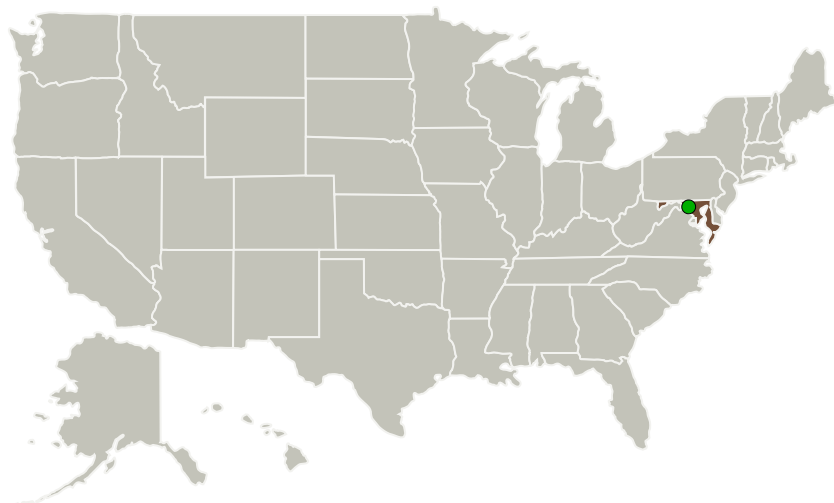
Completed Technology Project (2015 - 2017)



Project Introduction

NASA has unique non-contact precision metrology requirements for dimensionally inspecting the global position and orientation of large and highly-polished multi-segmented mirrors (in an as-installed configuration), such as those used on the James Webb Space Telescope. SURVICE Metrology has assembled a world-class team of metrologists and optical physicists to develop M-TEC, an innovative non-contact metrology solution that extends traditional deflectometry for determining reflective-surface profiles by combining pattern matching and high performance computing techniques. In addition to our in-house staff of experts in metrology and optics, our team includes industry-recognized academic experts in metrology. Our solution has demonstrated the ability to accurately measure the global position and orientation of mirror segments in an as-installed configuration using non-contact means from a safe distance to allow measurements to be made with minimal risk to the asset. SURVICE proposes to further research and develop the technology under the Phase II effort, culminating with a fully-functional and validated prototype.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
SURVICE Engineering Company, LLC	Lead Organization	Industry	Belcamp, Maryland
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations

Maryland

Project Transitions

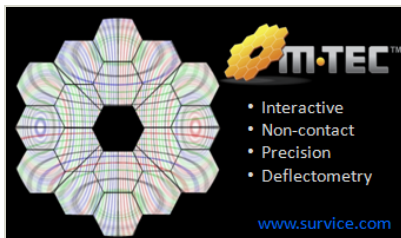
▶ **May 2015:** Project Start

✓ **May 2017:** Closed out

Closeout Documentation:

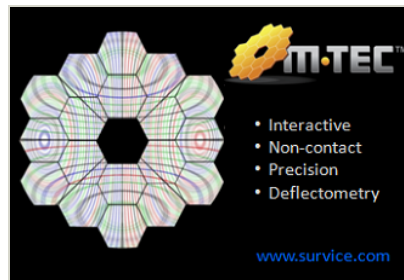
- Final Summary Chart(<https://techport.nasa.gov/file/138209>)

Images



Briefing Chart

High Performance Computing-Accelerated Metrology for Large Optical Telescopes Briefing Chart (<https://techport.nasa.gov/image/127213>)



Final Summary Chart Image

High Performance Computing-Accelerated Metrology for Large Optical Telescopes, Phase II Project Image (<https://techport.nasa.gov/image/130304>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

SURVICE Engineering Company, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

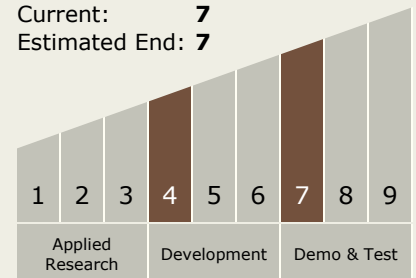
Carlos Torrez

Principal Investigator:

Mark Butkiewicz

Technology Maturity (TRL)

Start: 4
Current: 7
Estimated End: 7



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.3 Optical Components

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System